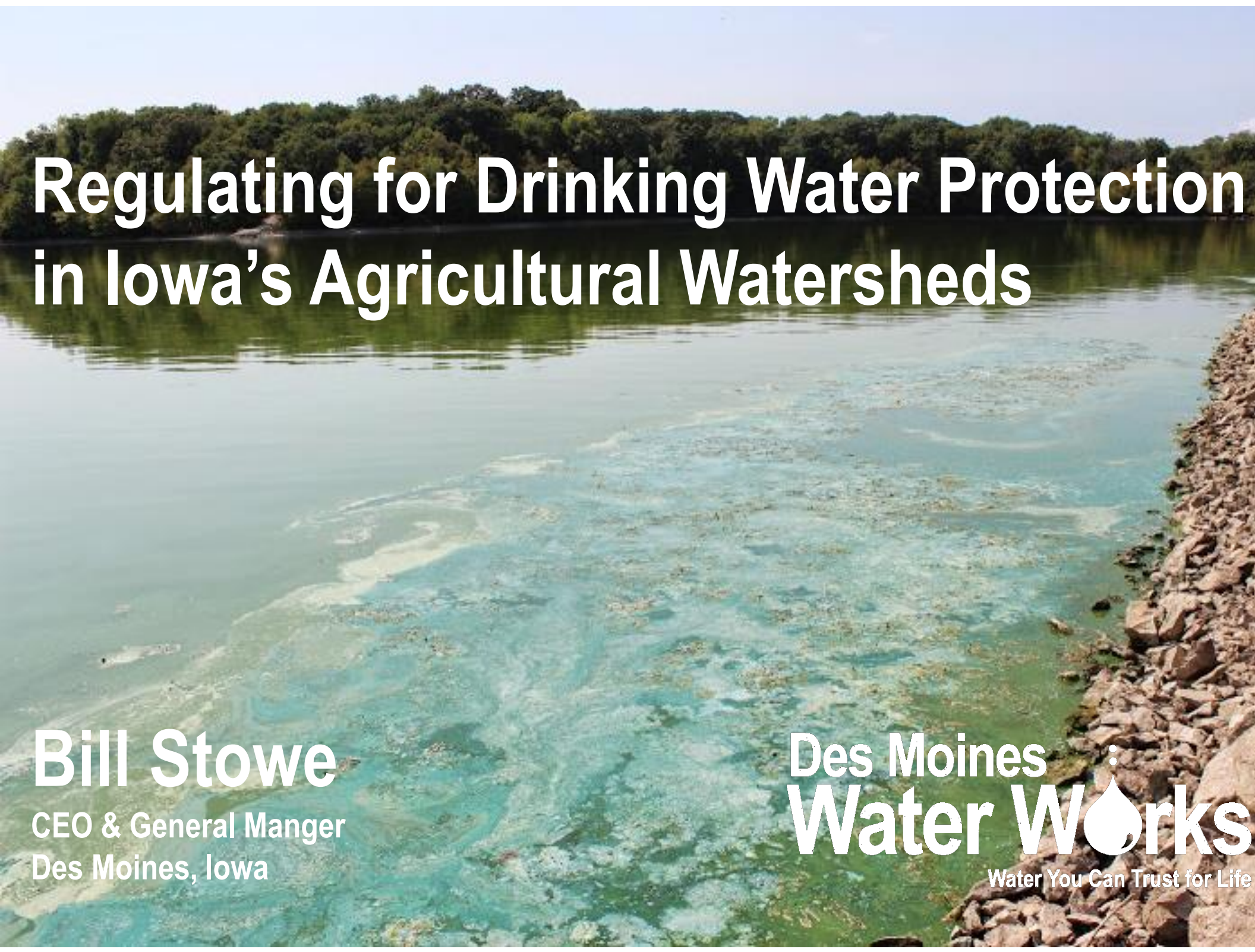
Regulating for Drinking Water Protection in Iowa's Agricultural Watersheds



Bill Stowe

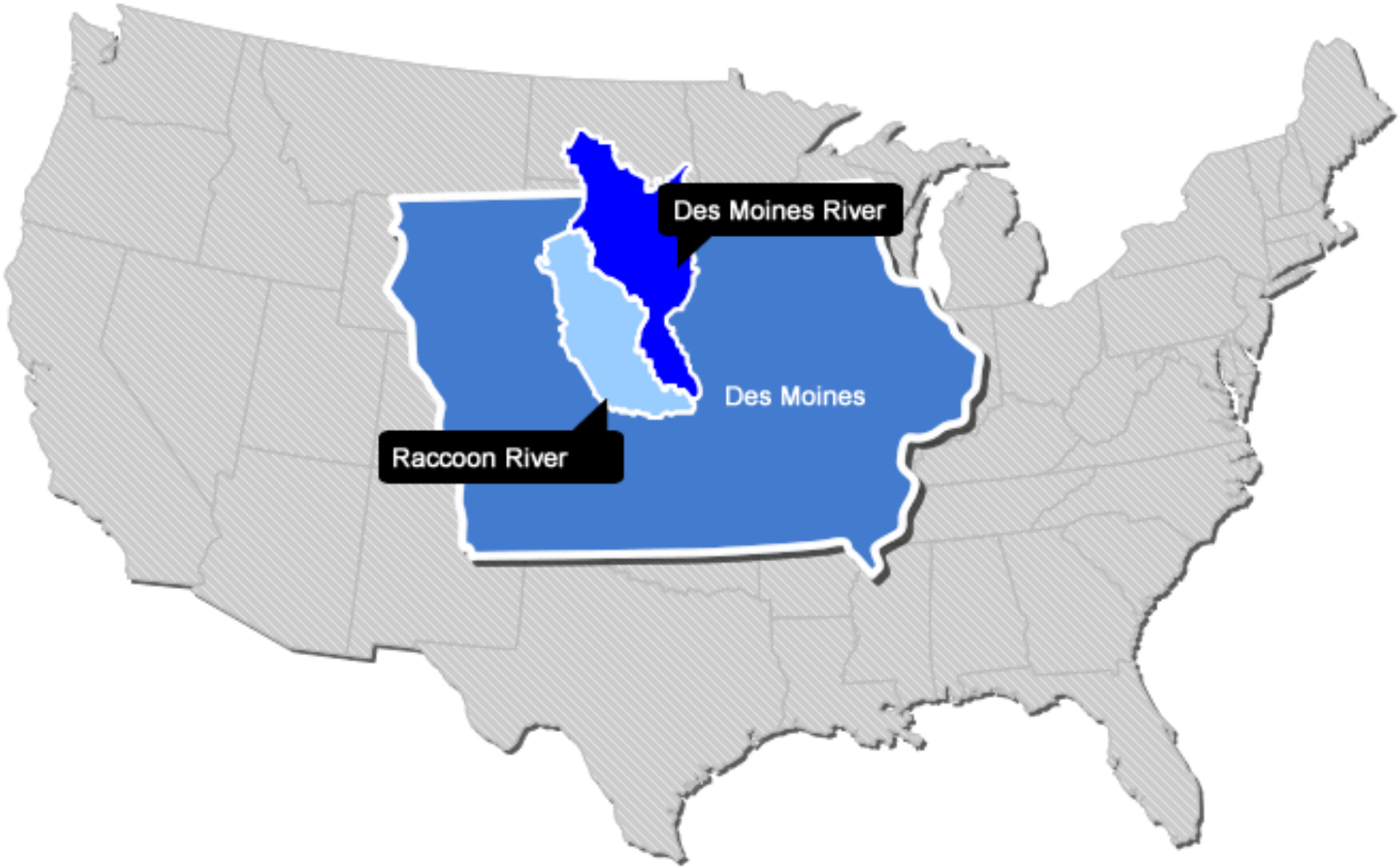
CEO & General Manger

Des Moines, Iowa

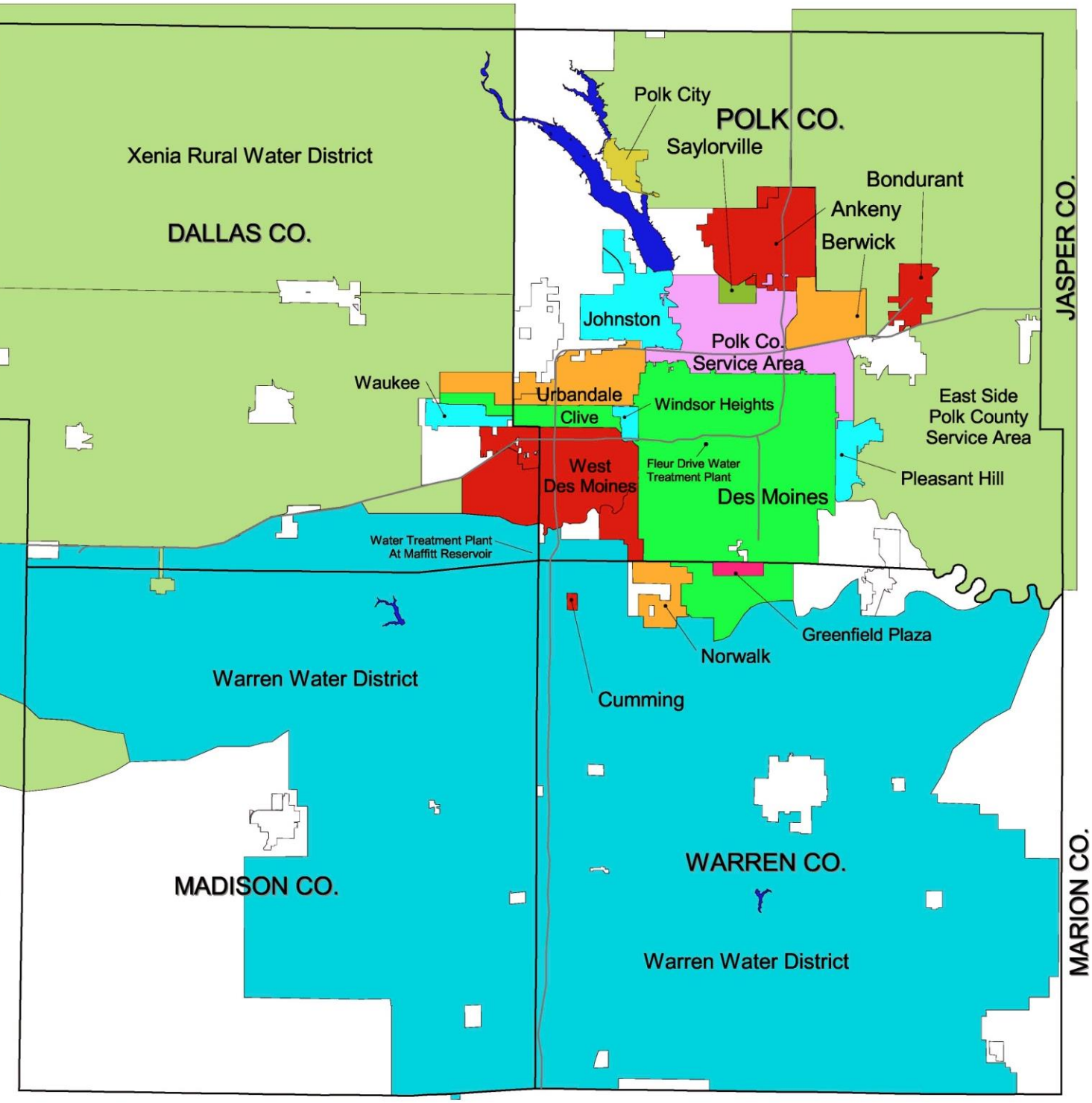
Des Moines Water Works

Water You Can Trust for Life

Des Moines Lobe: Raccoon River & Des Moines River Watersheds



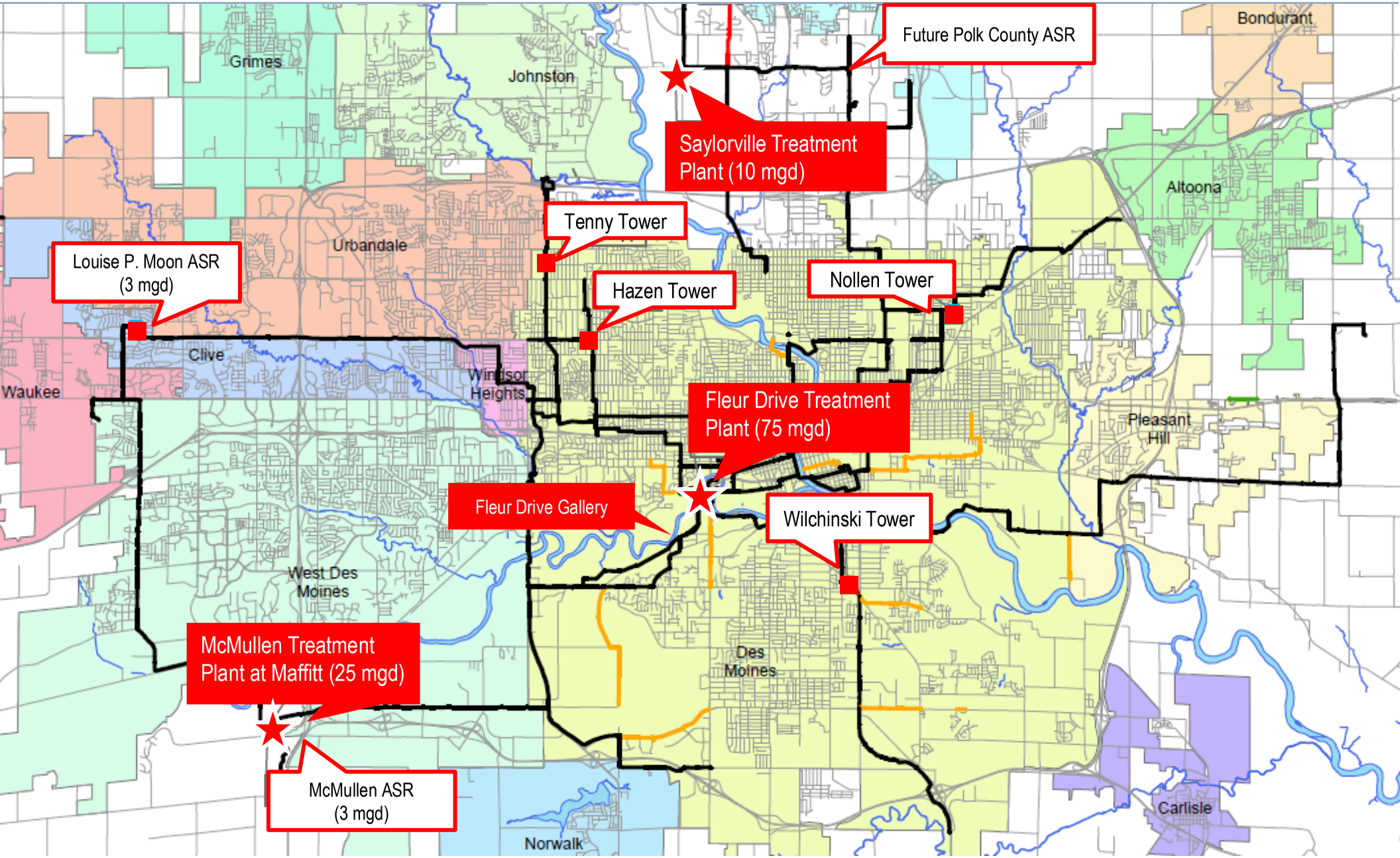
DMWW Service Area



- Urban
- Suburban
- Rural

DMWW Treatment Plants & Distribution System

3 treatment plants
2 ASR wells
1 infiltration gallery
1,360 miles of pipe



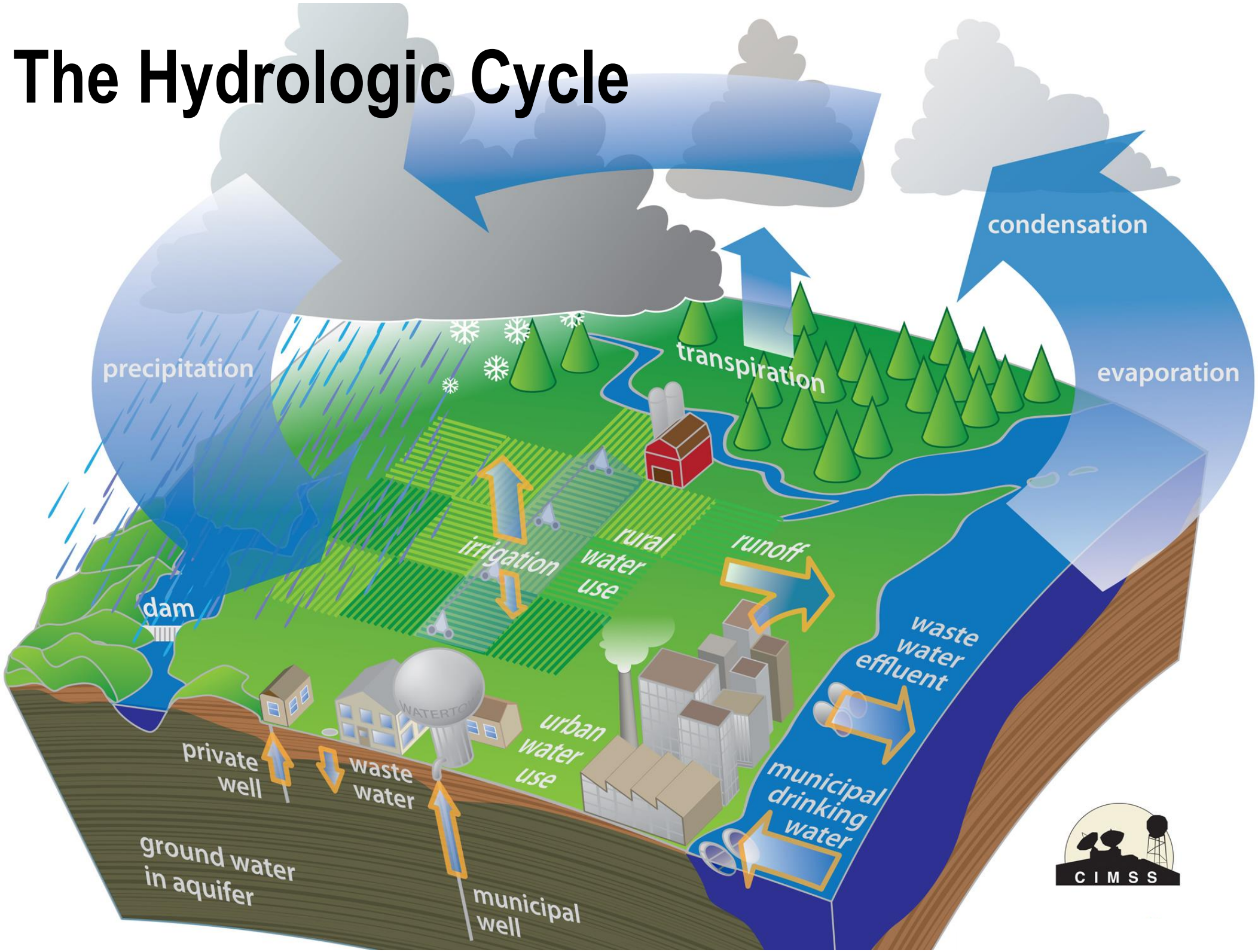
Safe Drinking Water Act Laboratory Testing

- **60,000** analyses conducted by DMWW for annual water production, at a retail cost of **$650,000**.
- There are also a number of unregulated contaminants that are voluntarily monitored to ensure the safety of our customers, i.e. Cyanobacteria and algal toxins.

Microorganisms	7
Disinfectants	3
Disinfection Byproducts	4
Inorganic Chemicals	16
Organic Chemicals	53
Radionuclides	4
TOTAL	**87***

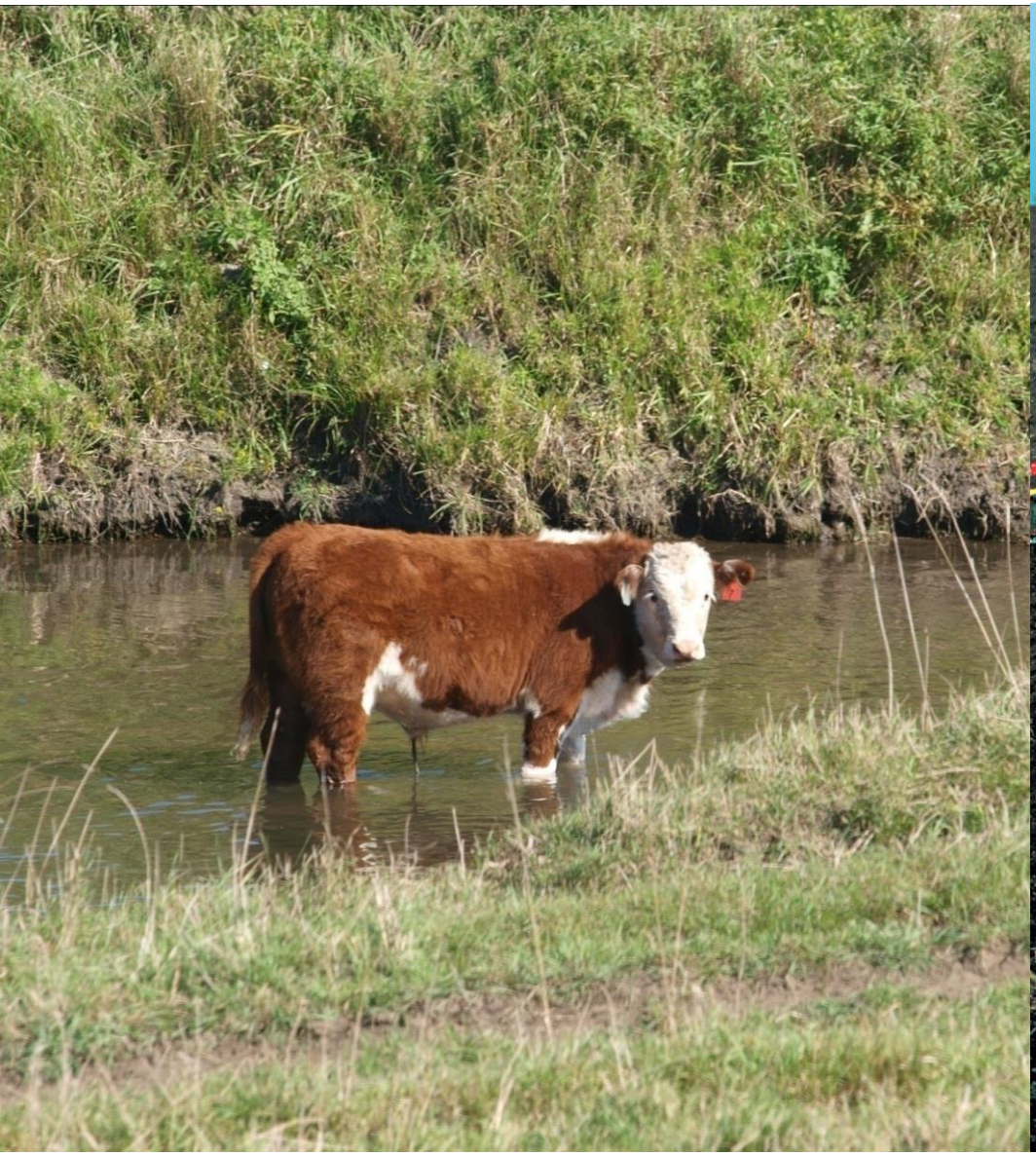
**30 related to agriculture*

The Hydrologic Cycle

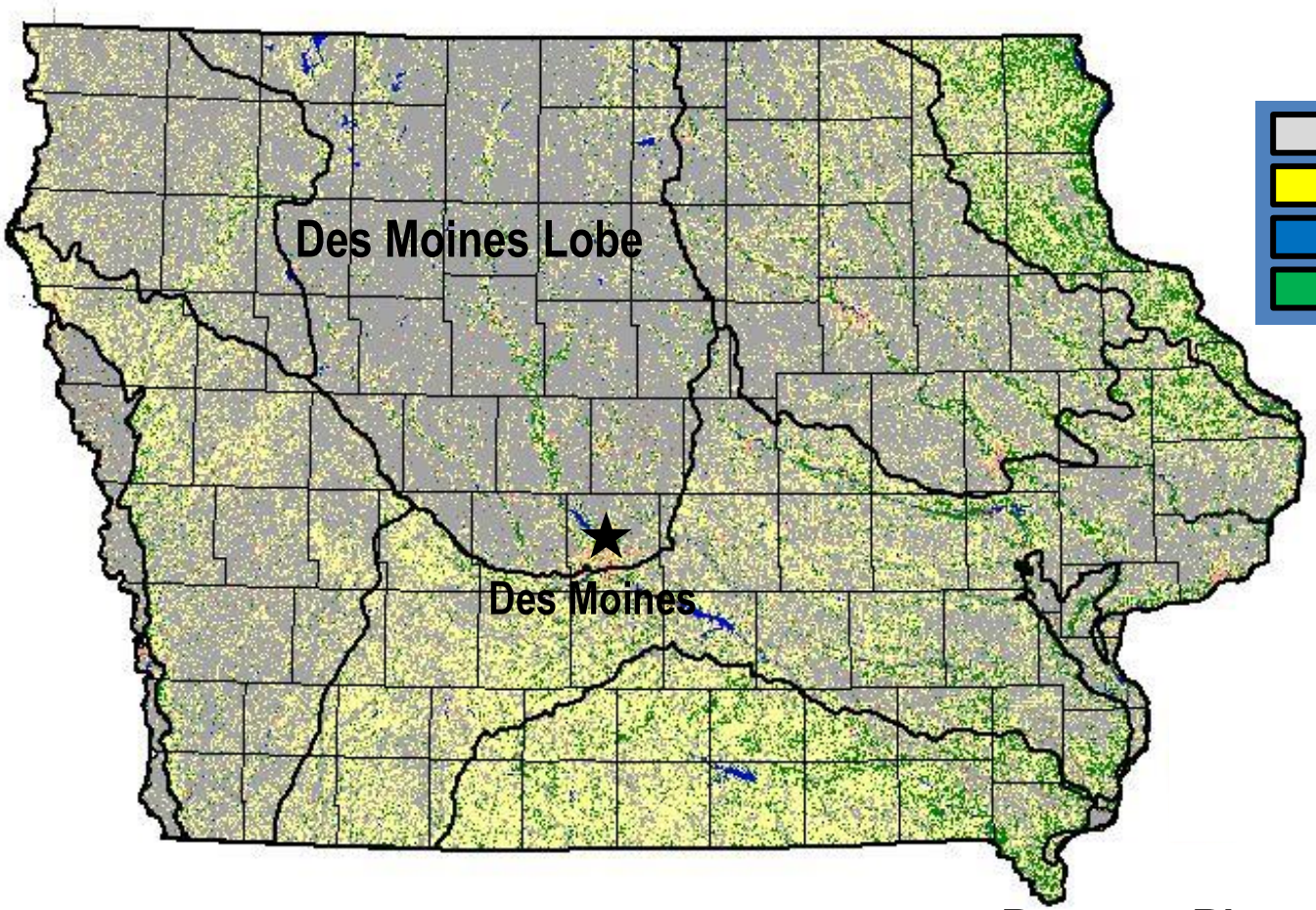


Agriculture Myth:
The Family Farm that "Feeds the World"

Industrial Agriculture Reality: Highly Capital Intensive, Federally Subsidized Business



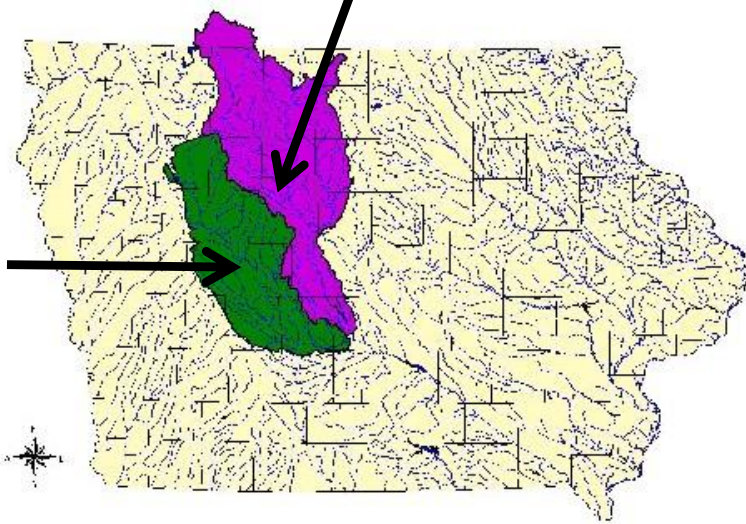
Iowa Land Use: Driver of Surface Water Quality in Iowa



Row crop
Grass
Water
Woody

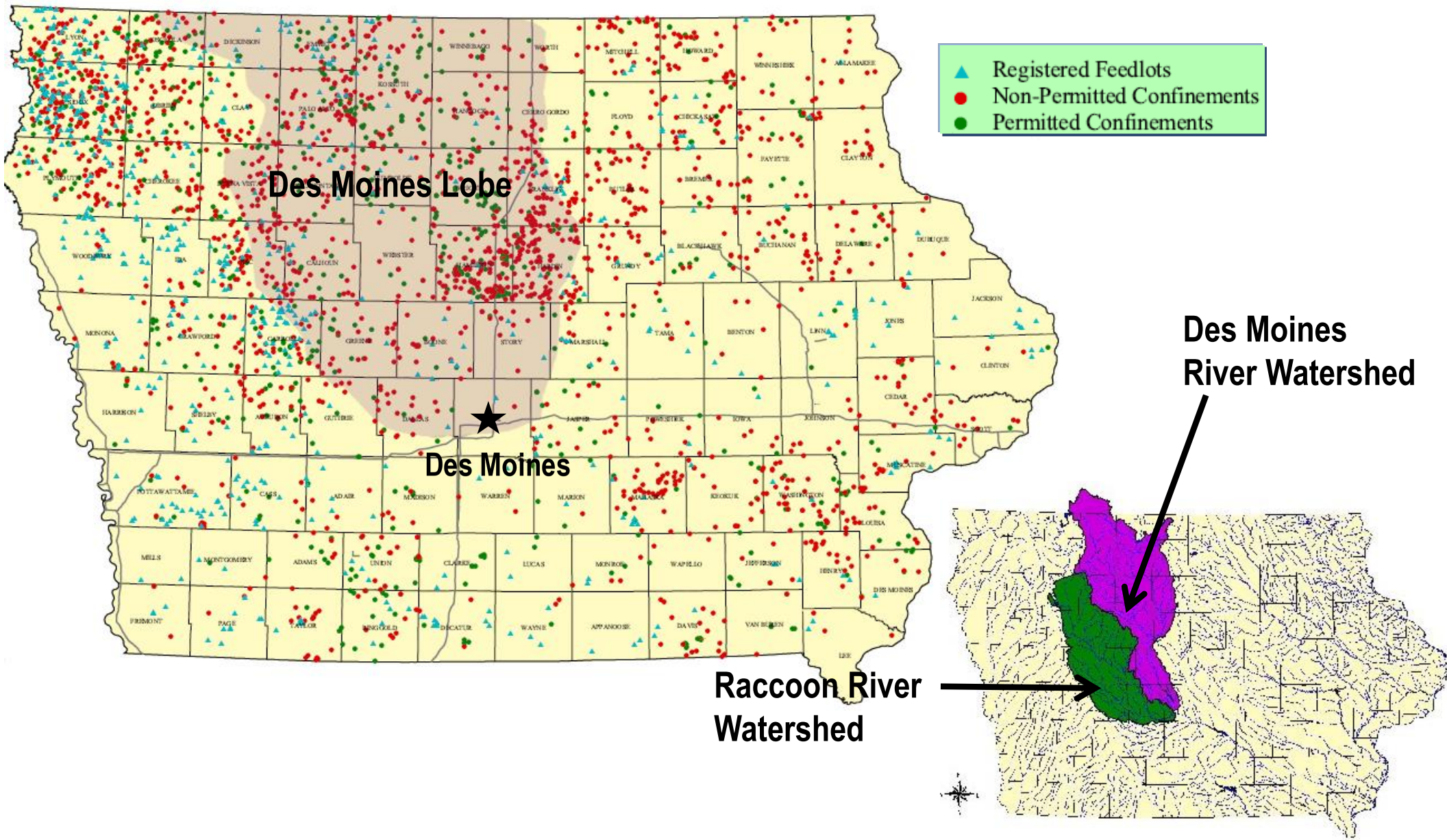
Des Moines River Watershed

Raccoon River Watershed



Approximately 10,000 square miles upstream

Iowa Land Use: Driver of Surface Water Quality in Iowa



Top Pollutant Concerns in Source Water

- **Nutrients:** nitrates, phosphorus, ammonia
- Microbial Contaminants: bacteria, protozoa, and viruses
- Spills
- Total Organic Carbon
- Trichloroethylene (TCE)
- Total Trihalomethanes (TTHM)
- Emerging Contaminants: pharmaceuticals and personal care products, and hexavalent chromium

Nitrates (NO3) in Water

- EPA Safe Drinking Water Standard: **10 mg/L**
- Nitrate levels above the standard are a **public health** risk. Particularly at risk are infants below six months of age who, if left untreated, could become seriously ill or die.
- Nitrate treatment not addressed through traditional lime softening/filtration system. Side-stream treatment is required.

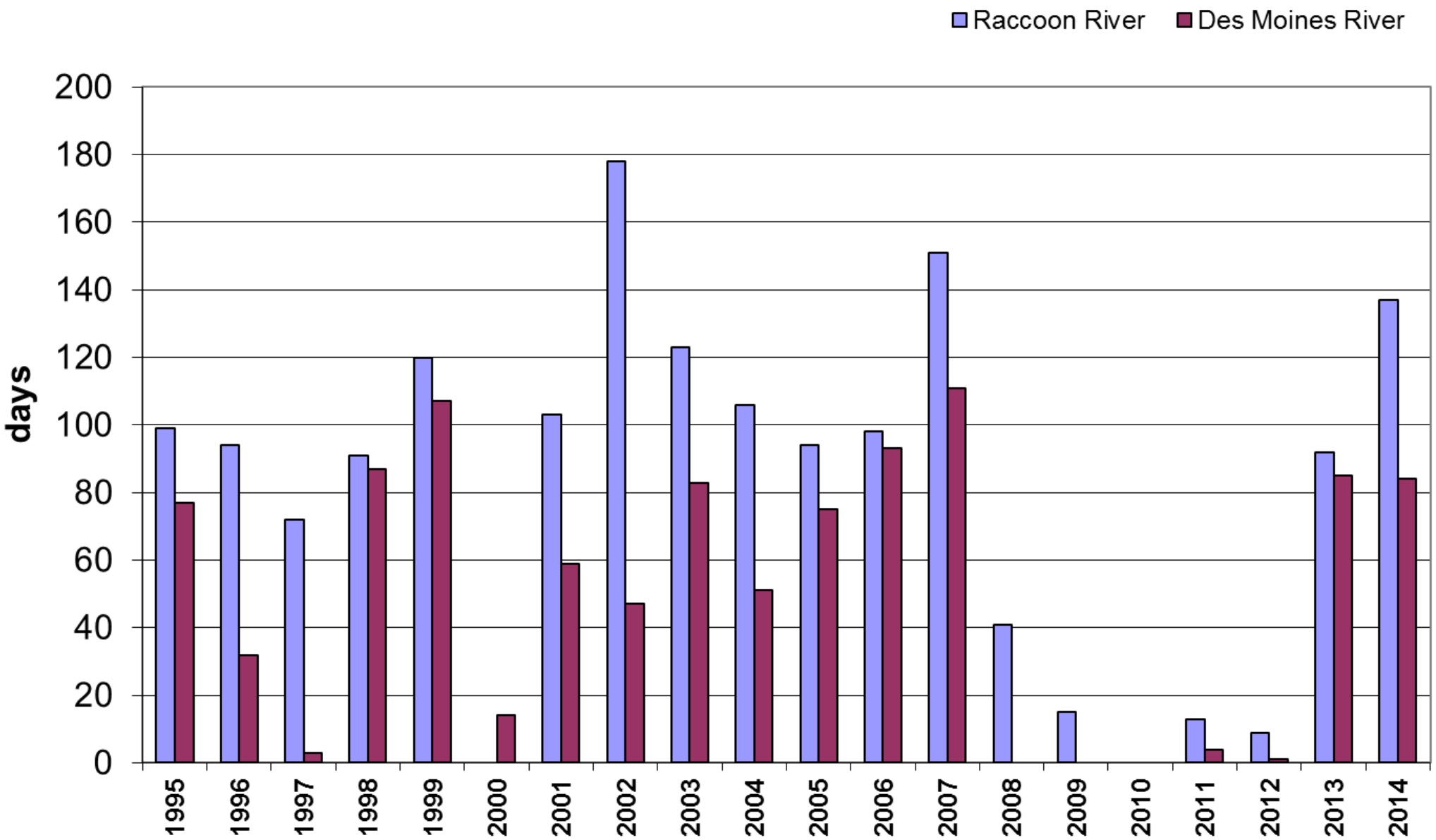
Gulf of Mexico Dead Zone at 5 Year Average:

Nutrient Reduction Strategy

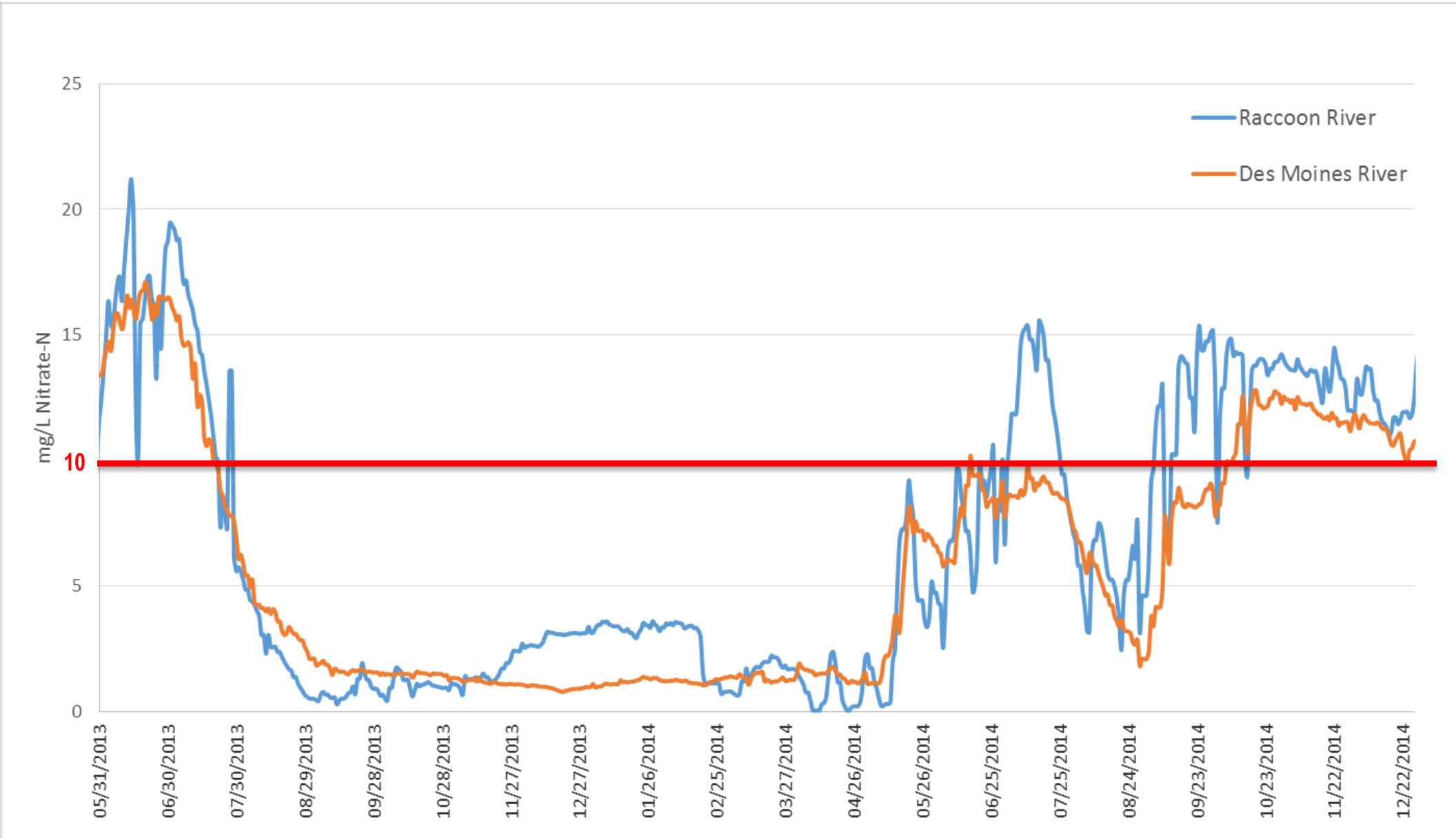
Iowa Public Policy Approach

- "Nonpoint sources account for 92% of the total nitrogen…."
- Reduce Nutrient Pollutants by 45%
  - No timelines
  - No commitments to measurement or metrics
  - No resource commitments to voluntarism
- Regulate 10% of Nutrient Contributors and Pursue Voluntarism (Non-regulation) of 90%

Number of Days Above the 10 mg/L Nitrate Safe Drinking Water Standard



Average Nitrate Concentration Since Nutrient Reduction Strategy Implemented



2013 Denitrification Costs

Additional cost in 2013 to meet EPA drinking water standard

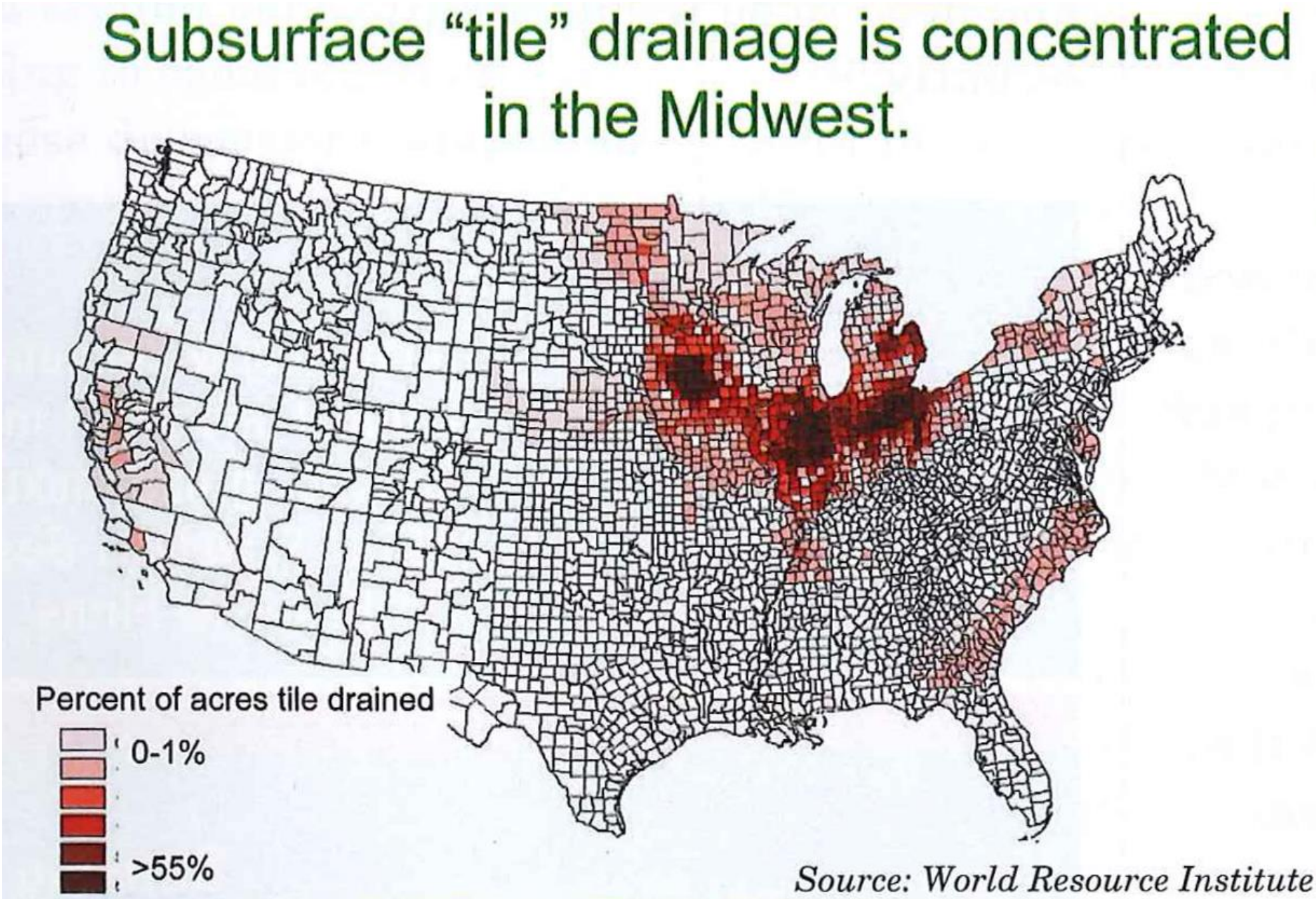
Treatment Cost	$722,500
Lost Revenue	$186,200
Total Expense	**$908,700**

Paid for by DMWW ratepayers

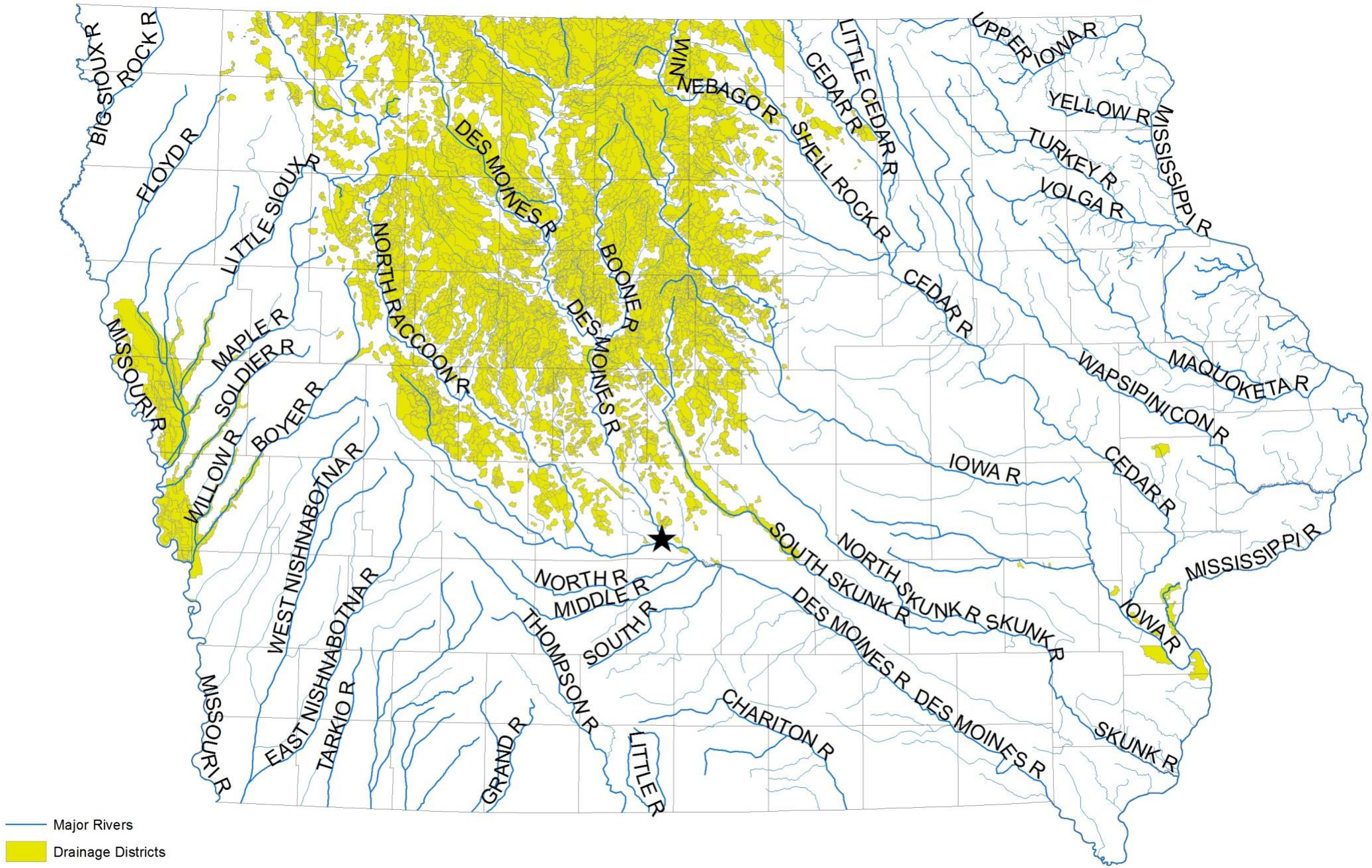
Estimated Cost for New Denitrification Facility

$76 million – $183 million

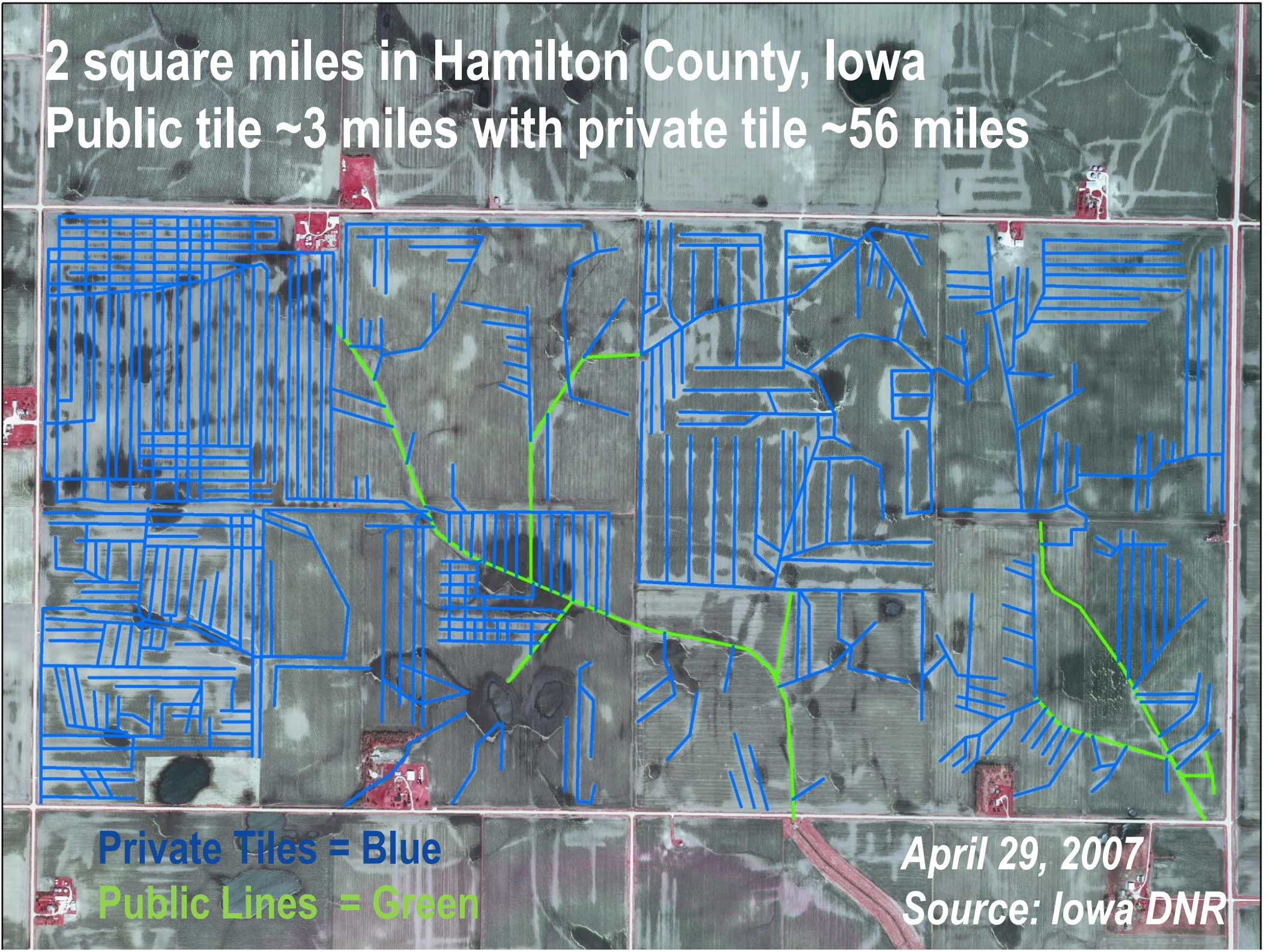
Tile Drainage Concentration



Iowa Drainage Districts




Drainage Tiling:
Increasing Water
Quantity while
Reducing Water
Quality
Regulate to treat at
the point of
discharge of outlet


2 square miles in Hamilton County, Iowa
Public tile ~3 miles with private tile ~56 miles
Private Tiles = Blue
Public Lines = Green
April 29, 2007
Source: Iowa DNR

Sac County, Iowa

Point Source or Non-point Source: Can You See the Difference?

Wastewater Treatment Plant Discharge

Point source
Regulated
Treated discharge
Permitted (with discharge limits)
Potential contaminants discharged
Nitrates
Microbial
Pharmaceuticals
Location is mapped

Should one be regulated while the other is unregulated?

Agricultural Tile Drainage

Non-point source
Non-regulated
Non-treated discharge
Non-permitted (no discharge limits)
Potential contaminants discharged
Nitrates
Microbial
Pharmaceuticals
Location is un-mapped
(commonly)

Conservation Practices


Cover Crops


Buffer Strips

Bioreactors


Constructed Wetlands

Regulation Protects Community Interests

- **Pharmaceuticals** → Patient Safety
- **Restaurants** → Patron/Public Safety
- **Air Traffic** → Travelers/Commerce Safety
- **Traffic Laws** → Motorist Safety
- **Air Quality** → Human and Wildlife Safety
- **Water Quality** → Heavily regulated in urban environment, but voluntarily "regulated" in agriculture

Has voluntary environmental protection worked?

DDT… Lead in gasoline … Phosphorus in detergents

Des Moines Water Works
Commitment to the Community

Invest in Infrastructure + **Improve Technologies** + **Advocate for Clean Water**

=

Regulate to Protect Source Waters

Safe, Affordable and Abundant Water You Can Trust for Life

clean water is for life

Des Moines Water Works

Water You Can Trust for Life

www.dmww.com | | dsmh2o.com

Customer Service: (515) 283-8700 | 24/7 Emergency: (515) 283-8772

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